# International Society for Aerosols in Medicine

## 10th Biennial Congress
## May 15-19, 1995
## Hamilton, CANADA

Topics include

- Basic Aerosol Science
- Therapeutics
- Diagnostics
- Pharmacology
- Environmental
- Regulatory

Abstract Deadline - Postmarked Dec. 1, 1994

For registration and abstract forms please contact:

Sharon Gould
Continuing Education
Faculty of Health Sciences
McMaster University
1200 Main St. W.
Hamilton, Ontario
CANADA, L8N 3Z5

# AEROSOL SCIENCE AND TECHNOLOGY

THE JOURNAL OF THE AMERICAN ASSOCIATION FOR AEROSOL RESEARCH

AAAR Office, 1330 Kemper Meadow Drive, Cincinnati, OH 45240 Phone: (513) 742-2020 Fax: (513) 742-3355

## CONTENTS

### VOLUME 20, NUMBER 1, 1994

**A Cloud Chamber Study of the Effect That Nonprecipitating Water Clouds Have on the Aerosol Size Distribution** 1
W. A. Hoppel, G. M. Frick, J. W. Fitzgerald, and B. J. Wattle

**A Sonic Jet Corona Ionizer for Electrostatic Discharge and Aerosol Neutralization** 31
Francisco J. Romay, Benjamin Y. H. Liu, and David Y. H. Pui

**Computer Simulation of Photophoretic Force on Rapidly Vaporizing Heterogeneous Droplet** 42
Marek A. Sitarski

**Submicrometer Aerosol Generator Development for the U.S. Environmental Protection Agency's Human Exposure Laboratory** 51
Thomas M. Peters, HungMin Chein, Dale A. Lundgren, and Jon Berntsen

**Infrared Properties of Atmospheric Aerosol Constitutents: Polyaromatic Hydrocarbons and Terpenes** 62
Robert A. Sutherland, R. K. Khanna, and M. J. Ospina

**Effects of an Applied Electric Field on Collection Efficiency by a Charged Droplet for Dust Particles in Charged Droplet Scrubbers** 71
Satoru Sumiyoshitani

**Effect of Radiative Heat Transfer on the Coagulation Dynamics of Combustion-Generated Particles** 83
Daniel W. Mackowski, Menelaos Tassopoulos, and Daniel E. Rosner

**Multifractal Analysis of Airborne Microcontamination Particles** 100
Stephen Klement, Johann Nittman, Karl W. Kratky, and William P. Acito

**Particle Mixing and Diffusion in the Turbulent Wake of a Single Cylinder** 111
James K. Helgesen and Michael J. Matteson

**Condensation of Supersaturated Vapors of Dioctylphthalate: Homogenous Nucleation Rate Measurements** 127
Jiří Smolík and Vladimír Ždímal

### VOLUME 20, NUMBER 2, 1994

**Editorial** 135

**Effects of Mixed Convection Flow on Aerosol Generation in a Condenser Tube** 136
Young Kag Kim and Sang Soo Kim

**Computer Simulation of Monodisperse Aerosol Collection in Fibrous Filters** 149
Mohammad S. El-Shobokshy, Sami A. Al-Sanea, and Abderrahim M. Adnan

**Use of Multiple Fractal Dimensions to Quantify Airborne Particle Shape** 161
Ying Xie, Philip K. Hopke, Gary Casuccio, and Brad Henderson

**Investigations of the Collection Efficiency of an Electrostatic Precipitator with Turbulent Effects** 169
Zhao Zhibin and Zhang Guoquan

**Inertial and Gravitational Deposition of Particles in a Square Cross Section Bifurcating Airway** 177
Bahman Asgharian and Satish Anjilvel

**Deposition of Tobacco Smoke Particles in a Low Ventilation Room** 194
Mindi Xu, Matty Nematollahi, Richard G. Sextro, Ashok J. Gadgil, and William W. Nazaroff

**Simulation of Brownian Coagulation in the Presence of van der Waals Forces and Viscous Interactions** 207
Veli-Matti Kerminen

**Cigarette Smoke Deposition in the Tracheobronchial Tree: Evidence for Colligative Effects** 215
Robert F. Phalen, Michael J. Oldham, Richard C. Mannix, and G. Michael Schum

**VOLUME 20, NUMBER 3, APRIL 1994**

**Particle Filter Based on Thermophoretic Deposition from Natural Convection Flow** 227
A. G. B. M. Sasse, W. W. Nazaroff, and A. J. Gadgil

**Dry Deposition Velocities as a Function of Particle Size in the Ambient Atmosphere** 239
Jim J. Lin, Kenneth E. Noll, and Thomas M. Holsen

**On the Source of the Submicrometer Droplet Mode of Urban and Regional Aerosols** 253
Zhaoyue Meng and John H. Seinfeld

**Thoron Versus Radon: Comparison of Measured Progeny Aerosol Size Distributions** 266
Keng-Wu Tu, Earl O. Knutson, and Andreas C. George

**Determination of Water Activity in Ammonium Sulfate and Sulfuric Acid Mixtures Using Levitated Single Particles** 275
Yong Pyo Kim, Betty K.-L. Pun, Chak K. Chan, Richard C. Flagan, and John H. Seinfeld

**Letters to the Editor** 285

**Announcement**

## VOLUME 20, NUMBER 4, 1994

**A Numerical Investigation into the Sampling Performance of a Tube Sampler** 291
B. Yan, D. B. Ingham, and S. J. Dunnett

**Seasonal Trends in Los Angeles Ambient Organic Aerosol Observed by High-Resolution Gas Chromatography** 303
Lynn M. Hildemann, Monica A. Nazurek, Glen R. Cass, and Bernd R. T. Simoneit

**Particle Impaction on a Supersonic Cone** 318
L. J. Forney

**The Characteristics of Ionic Wind and Its Effect on Electrostatic Precipitators** 330
Wen-Jey Liang and T. H. Lin

**Size- and Composition-Dependent Response of the DAWN-A Multiangle Single-Particle Optical Detector** 345
W. D. Dick, P. H. McMurray, and J. R. Bottiger

**Analysis of Constant-Rate Aerosol Reactors** 363
Benjamin D. Shaw and Jeffrey Lawman

**Particle Deposition on a Truncated Cylinder in a Supersonic Flow at Low Pressure** 375
Jae J. Oh and Sang S. Kim

## VOLUME 21, NUMBER 1, 1994

**Chemical Mass Balance Source Apportionment of $PM_{10}$ during the Southern California Air Quality Study** 1
John G. Watson, Judith C. Chow, Zhiqiang Lu, Eric M. Fujita, Douglas H. Lowenthal, Douglas R. Lawson, and Lowell L. Ashbaugh

**Bipolar Charging of Aerosol Particles in Electropositive Gas of High Purity** 37
A. V. Filippov and H. Burtscher

**Properties of the Log-Normal Particle Size Distribution** 46
Jost Heintzenberg

**On the Sublayer Model for Turbulent Deposition of Aerosol Particles in the Presence of Gravity and Electric Fields** 49
Fa-Gung Fan and Goodarz Ahmadi

**Measurement of Particle Deposition Velocity Toward a Horizontal Semiconductor Wafer by Using a Wafer Surface Scanner** 72
Gwi-Nam Bae, Seung O. Park, and Chun Sik Lee

**Monte Carlo Simulation of Particle Coagulation and Sintering** 83
M. Kamal Akhtar, G. Glenn Lipscomb, and Sotiris E. Pratsinis

**Erratum** 94

**Announcements**

## VOLUME 21, NUMBER 2, 1994

**Intercomparison of Four Methods to Determine Size Distributions of Low-Concentration (~100 $cm^{-3}$), Ultrafine Aerosols ($3 < D_p < 10$ nm) with Illustrative Data from the Arctic** 95
A Wiedensohler, P. Aalto, D. Covert, J. Heintzenberg, and P. H. McMurray

**Influence of Coal Type on Water Spray Suppression of Airborne Respirable Dust** 110
J. A. Organiscak and M. H. Leon

**Effects of Carinal Ridge Shapes on Lung Airstreams** 119
T. B. Martonen, Y. Yang, and Z. Q. Xue

**Particle Losses in Glass Honeycomb Denuder Samplers** 137
C. Sioutas, P. Koutrakis, and J. M. Wolfson

**Side Drift of Aerosols in a Two-Dimensional Slowly Oscillating Sonic Field** 149
Y. Dain, P. Vainshtein, M. Fichman, and C. Gutfinger

**Wind Tunnel Experiments of Large Particle Reentrainment-Deposition and Development of Large Particle Scaling Parameters** 157
David A. Braaten

**Gravitational Transport of Particles in Pure Gases and Gas Mixtures** 170
S. K. Dua, P. Brand, E. Karg, and J. Heyder

**Length Separation of Fibers** 179
P. A. Baron, G. J. Deye, and J. Fernback

## VOLUME 21, NUMBER 3, 1994

**Mathematical Modeling of Silicon Carbide Whisker Deposition in the Lung: Comparison between Rats and Humans** 193
K. A. Strom and C. P. Yu

**Use of Chain Code Histogram Method to Quantify Airborne Particle Shapes** 210
Ying Xie, P. K. Hopke, Gary Casuccio, and Brad Henderson

**Plugging Passages with Particles: Refining the Morewitz Criteria** 219
Vincent J. Novick

**Development and Evaluation of a Low Cutpoint Virtual Impactor** 223
C. Sioutas, P. Koutrakis, and B. A. Olson

**Generation of Aerosol Particles by Boiling of Suspensions** 236
Yasuo Kousaka, Takahiro Horiuchi, Yoshiyuki Endo, and Seiji Aotani

**Airborne Fiber Separation by Electrophoresis and Dielectrophoresis: Theory and Design Considerations** 241
R. J. Han, O. R. Moss, and B. A. Wong

**VOLUME 21, NUMBER 4, 1994**

**SPECIAL ISSUE**
**LA-ACSAS**
**James R. Young, Guest Editor**

**The Los Angeles Aerosol Characterization and Source Apportionment Study: An Overview** 259
James R. Young, Carol Ellis, and Susanne Hering

**The Los Angeles Aerosol Characterization and Source Apportionment Study: A Meteorological–Air Quality Analysis** 269
A. Davidson

**Chemical Signatures of the Los Angeles Aerosol ($d_p < 3.5\ \mu$m)** 283
Alan S. Kao and Sheldon K. Friedlander

**The Additivity and Stability of Carbon Signatures Obtained by Evolved Gas Analysis** 294
J. R. Turner and S. V. Hering

**Evolved Gas Analysis of Secondary Organic Aerosols** 306
Daniel Grosjean, Edwin L. Williams II, Eric Grosjean, and Tihomir Novakov

**Fourier Transform Infrared Spectroscopy of Aerosol Collected in a Low Pressure Impactor (LPI/FTIR): Method Development and Field Calibration** 325
David T. Allen, Edward J. Palen, Mitchell I. Haimov, Susanne V. Hering, and James R. Young

**Non-Fossil-Fuel Fine-Particle Organic Carbon Aerosols in Southern California Determined during the Los Angeles Aerosol Characterization and Source Apportionment Study** 343
Isaac R. Kaplan and Robert J. Gordon

**Motor Vehicle Contributions to Fine Carbonaceous Aerosol in Los Angeles** 360
Sotiris E. Pratsinis

**Fuchs Award** 367

**International Aerosol Fellows** 368

**Note of Appreciation and Thanks** 370

**Author Index** 373

**Title Index** 375